IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Applicants:	B.T. Tolton et al.	Attorney Docket No.: LAMA122586
Application No.:	10/799444	Art Unit: 2884 / Confirmation No.: 6250
Filed:	March 12, 2004	Examiner: Djura Malevic
Title:	REMOTE SENSING OF GAS LEAKS	

APPELLANT'S APPEAL BRIEF

Seattle, Washington
April 21, 2010

TO THE COMMISSIONER FOR PATENTS:

This Appeal Brief is filed in support of the Notice of Appeal filed September 21, 2009, appealing the Examiner's final rejection dated March 20, 2009, of pending Claims 1-4, 6, 10, 15-18, 20-25 and 33.

In the final Office Action, Claims 1, 2, 15 and 16 were rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson et al. (U.S. Patent No. 6,750,453 B1) in view of Sachse (U.S. Patent No. 6,611,329 B2). Claims 3 and 4 were rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson and Sachse in view of Hodgkinson (WO 01/94916). Claim 6, 10, 18, 20, 24, 25 and 33 were rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson and Sachse in view of Jeon (U.S. Patent No. 5,742,383). Claim 17 was rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson and Sachse in view of Smith et al. (U.S. Patent No. 6,756,592 B1). Claims 21, 22 and 23 were rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson and Sachse in view of Jeon and Hodgkinson.

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I. REAL PARTY IN INTEREST

The Assignee, Synodon Inc., is the real party in interest, by way of an assignment recorded on July 26, 2004.

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II. RELATED APPEALS AND INTERFERENCES

There has been a prior appeal for this application, but the examiner accepted the arguments of the appeal and reopened prosecution to enter a new ground of rejection.

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III. STATUS OF CLAIMS

Claims 5, 7-9, 11-14, 19 and 26-31 have been cancelled. Claim 32 was not entered. Claims 1-4, 6, 10, 15-18, 20-25 and 33 have been finally rejected, and it is these rejections that are being appealed.

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IV. STATUS OF AMENDMENTS

No amendments to the application have been filed subsequent to the final rejection of March 20, 2009.

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V. SUMMARY OF CLAIMED SUBJECT MATTER

Of the claims at issue, Claims 1, 18 and 21 are independent claims. Claims 2 - 4, 6, 10, and 15 – 17 depend directly or indirectly from Claim 1; Claims 20, 24, 25 and 33 depend directly or indirectly from Claim 18; and Claims 22 and 23 depend from Claim 21. In the summary below, the paragraph numbers refer to the numbers in the application as filed.

Claim 1 refers to a method of detecting gas leaks. A gas filter correlation radiometer 101 (para 17 and 18) is provided comprising a window 103 or 203 in a housing 100 or 200 (para 18 and 20), optics defining a first optical path 110 or 210 and a second optical path 112 or 212 between the window and a detector section mounted in the housing (para 18 and 20), a beam splitter 106 or 206 and 207.

A target area 354 (para 24) is traversed with a gas filter correlation radiometer 101 (para 17 and 18) having a field of view 352 (para 24) oriented towards the target area 354. The gas filter correlation radiometer 101 is tuned to detect ethane (para 18). A gas leak 356 (para 24) is identified upon the gas filter correlation radiometer 101 detecting the presence of ethane 358 (para 24) by detecting variations in solar radiation reflected from the target area 354.

Claim 2 and 3 refers to the GFCR being tuned to detect ethane using an ethane absorption peak at 3000 cm^{-1} (see para. 7 and 18). Claims 3 and 8 refer to the GFCR being tuned to detect ethane using an ethane absorption peak a bandwidth of 2850 to 3075 cm^{-1} (see para. 8 and 18). Claims 4 and 9 refer to the GFCR being tuned to detect ethane using an ethane absorption peak at a bandwidth up to 150 cm^{-1} above or below 3000 cm^{-1} (see para. 9). Claim 6 refers to the method of Claim 1 using a GFCR similar to the GFCR claimed in Claim 21 and described below, but without specifying the bandwidth the GFCR is tuned to detect.

Claims 18 and 21 refer to a gas filter correlation radiometer 101 (GFCR - para. 17 and 18). The GFCR has a window 103 in a housing 100 (para. 18). Optics 124, 116, 122 (para 18)

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define a first optical path 110 and a second optical path 112 between the window 103 and a detector section 102A, 102B mounted in the housing 100 (para 18).

A bi-prism beam splitter 106 (in Claim 18) or a beam splitter 106 (in Claim 21) is mounted in the housing 100 as part of the optics for directing radiation entering the window 103 from an outside source along two divergent paths offset from each other through the prism or bi-prism to divide the radiation between the first optical path 110 and the second optical path 112 (para 19). The first optical path 110 has a first gas path length and the second optical path 112 has a second gas path length. The first gas path length is different from the second gas path length (para 19). There are electronics 108 for processing signals produced by the detector section as a result of radiation being directed by the optics onto the detector section (para 19).

In Claim 21, the GFCR 101 is tuned to detect ethane using an ethane absorption peak at a bandwidth of at least 2850 to 3075 cm^{-1} (para 8 and 18).

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VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1-4, 6, 10, 15-18, 20-25 and 33 currently stand rejected under 35 U.S.C. 103(a). In view of this rejection, the issues presented for review on appeal are as follows:

Issue 1 - Whether Claims 1, 2, 15 and 16 are unpatentable under 35 U.S.C. § 103(a) over Nelson et al. in view of Sachse.

Issue 2 - Whether Claims 3 and 4 are unpatentable 35 U.S.C. § 103(a) over Nelson and Sachse in view of Hodgkinson.

Issue 3 - Whether Claims 6, 10, 18, 20, 24, 25 and 33 are unpatentable 35 U.S.C. § 103(a) over Nelson and Sachse in view of Jeon.

Issue 4 - Whether Claim 17 is unpatentable 35 U.S.C. § 103(a) over Nelson and Sachse in view of Smith et al.

Issue 5 - Whether Claims 21, 22 and 23 are unpatentable 35 U.S.C. § 103(a) over Nelson and Sachse in view of Jeon and Hodgkinson.

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VII. ARGUMENT

This is an appeal to the Board of Patent Appeals and Interferences from the final Office Action dated March 20, 2009. In the Office Action, the Examiner rejected Claims 1-4, 6, 10, 15-18, 20-25 and 33 as allegedly being unpatentable under 35 U.S.C. 103(a).

Under 35 U.S.C. 103(a), a rejection of the claims generally must meet four key elements as set out by the Supreme Court in *Graham v. John Deere*, 383 U.S. 1, 148 USPQ 459 (1966), and summarized in the *Manual of Patent Examining Procedure (MPEP) Edition 8 (E8), August, 2001, Latest Revision July 2008*, s. 2141. These elements are as follows:

(A) Determining the scope and contents of the prior art;

(B) Ascertaining the differences between the prior art and the claims in issue;

(C) Resolving the level of ordinary skill in the pertinent art; and

(D) Evaluating evidence of secondary considerations.

Appellant submits that the Examiner has failed to determine correctly the scope and contents of the prior art and also to assess properly the differences between the references and the claimed invention.

Appellant further submits that the Examiner incorrectly combined the cited references in attempting to support the obviousness rejection. The Supreme Court decision in *KSR Int'l Co. Inc. v. Teleflex Inc.* 550. U.S. 550 U.S. 398 (2007) has rejected a strict adherence to the teaching, suggestion, and motivation test. However, the Court also affirmed that "[a] patent composed of several elements is not proved obvious merely by demonstrating that each element was, independently, known in the prior art" (at II(B)) and that there must still be some motivation to combine the references.

Nelson teaches a gas detector to simultaneously detect ethane and methane using gas cormodulated and a lock-in amplifier uses the resulting modulation of the detected signal to

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isolate the contribution to the signal caused by the active source from the additional contribution caused by background thermal radiation. Nelson's detectors do not have pixels, but rather each appear to generate a respective single signal representing the total radiation detected at the detector as a function of time.

Sachse teaches switching incoming radiation between two paths one of which has a filter for a bandwidth that the target substance absorbs and one of which has a filter for a different bandwidth for which the target substance has much different absorption. These beams are recombined to make an amplitude modulated signal detected at a detector, the amplitude of the modulation indicating the concentration of the gas of interest. Sachse discloses the use of various light sources including the sun. Sachse's detectors do not have pixels.

Issue 1 - Whether Claims 1, 2, 15 and 16 are unpatentable under 35 U.S.C. § 103(a) over Nelson et al. in view of Sachse.

a. Ascertaining the differences between the claimed invention and the references

Claim 1 requires identifying a gas leak upon the gas filter correlation radiometer detecting the presence of ethane by detecting variations in solar radiation reflected from the target area and received by the respective first detector and second detector.

Nelson (U.S. Patent No. 6,750,453 B1) discloses identifying a gas leak upon a gas correlation radiometer with first and second detectors detecting the presence of both ethane and methane. Nelson uses an active source, not solar radiation. Nelson does mention that prior art gas correlation radiometers, which Nelson describes as having a single detector which sequentially measures radiation on a target gas channel and a background gas channel, use solar radiation.

Sachse (U.S. Patent No. 6,611,329 B2) discloses using a variety of radiation sources including solar for a gas detection system that does not use gas correlation cells and whose

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primary purpose is to avoid the use of gas correlation cells (see col. 2 lines 56-59). Sachse does not teach detecting ethane, or indeed detecting natural gas at all.

As described in paragraph 0007 of the present application, ethane exists in much smaller quantities in the atmosphere than methane. In addition, ethane has a greater absorption depth than methane (see col. 9, lines 31-33 of Nelson). In a gas correlation radiometer using an active source or using background radiation from the earth, these benefits of ethane are not sufficient to make the ethane of a natural gas leak as easy to detect as the methane, given that ethane is a smaller component of natural gas than methane (see col. 1, lines 52-55 of Nelson). For this reason, Nelson discloses using detection of ethane only to confirm that a detection of methane is truly a detection of natural gas, instead of detecting natural gas from the detection of ethane alone.

Solar radiation can be used in a gas correlation radiometer detecting methane, and provides some advantages such as not requiring an active source, and reduced effects of thermal noise within the instrument and greater radiative contrast between a surface and leaked methane in the case of a leak from an underground pipe as compared with using background radiation from the earth (paragraph 0005 of the present application). However, solar radiation when used to detect methane also has a problem of having a large background, since the solar radiation has passed through the entire atmosphere and the methane within it. This results in a low sensitivity. Nelson (see col. 2, lines 30-41) blames the low sensitivity of gas correlation radiometry on the non-use of an active source, but fails to notice that the use of ethane can provide an alternative means of overcoming the problem of high background with solar radiation.

In the present invention, the use of solar radiation as the radiation source is combined with the detection of ethane. The high background of solar radiation due to the radiation having passed through the entire atmosphere is greatly attenuated with the detection of ethane as there is

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much less background ethane in the atmosphere than methane. The advantages of solar radiation over other sources are retained.

Thus, while the detection of ethane provides some advantages in confirming the presence of natural gas without the use of solar radiation, and the use of solar radiation has advantages and disadvantages in detecting natural gas by means of detecting methane, the combination of the use of solar radiation and the detection of natural by means of the detection of ethane provides a significant benefit beyond the mere aggregation of the individual benefits of these respective features.

b. Resolving the level of ordinary skill in the pertinent art

c. Determination of whether the claimed invention would have been obvious to one of ordinary skill in the art

As ethane comprises a much smaller proportion of natural gas than methane, the natural tendency of one of ordinary skill in the art would be to detect methane as a greater sensitivity to natural gas is obtained by detecting of methane, when radiation sources that do not involve passing the radiation through the entire atmosphere are used. Indeed, although Nelson discloses using ethane to confirm the presence of natural gas, Nelson teaches that the ethane component of natural gas is more difficult to detect than the methane (col. 1, lines 53-54).

Nelson specifically teaches away from the use of solar radiation, blaming the low sensitivity of prior art gas correlation radiometers on the use of passive sources including solar radiation as opposed to active sources (column 2, lines 30-41).

Sachse discloses the use of solar radiation as one of a list of possible radiation sources in a system to detect gases (col. 4, lines 10-14), but does not disclose or suggest the detection of natural gas, let alone ethane. Sachse is directed towards the detection of substances unsuitable for gas correlation cells (col. 2, lines 39-59), whereas natural gas including methane and ethane is

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suitable for such cells, and as such a person skilled in the art would be unlikely to look to Sachse for direction in suitable sources of radiation for natural gas detection systems using gas correlation cells. Sachse is thus irrelevant.

Nelson claims that "gas correlation radiometry is generally a passive technique that relies on solar illumination and scattering, or on thermal emission background." The background of the present application in paragraph 0005 mentions possible advantages of the use of solar radiation as well as the drawback of greater background due to the radiation having passed through the entire atmosphere. This drawback is greatly reduced, as noted above, by detecting natural gas by means of ethane which has a reduced background in the atmosphere. This provides a non-obvious benefit of combining the detection of methane with the use of solar radiation.

Accordingly, it is submitted that the claimed invention is not obvious in view of Nelson and Sachse. Claim 1 is thus patentable, and Claims 2, 15 and 16 are patentable for at least the same reasons.

Issue 2 - Whether Claims 3 and 4 are unpatentable 35 U.S.C. § 103(a) over Nelson and Sachse in view of Hodgkinson.

a. Determining the Scope and Content of Hodgkinson

Hodgkinson (WO 01/94916) discloses a system for measuring the concentration of a mixture flammable gases contained in a cell, as a proportion of a lower explosion limit (see p. 3). As an example of such a mixture of gases, Hodgkinson uses ethane and methane. Hodgkinson discloses a chart of an absorption spectrum of ethane. The spectrum shows at least some absorption in a broad bandwidth (Fig. 2, Fig. 3), but Hodgkinson teaches the use of a narrow bandwidth for more precise estimation of the concentration of gases contained in the cell (p. 4). Hodgkinson uses an active radiation source (p. 6).

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b. *Ascertaining the differences between the claimed invention and Hodgkinson*

Hodgkinson is not directed towards attempting to detect natural gas but to measure the concentration as compared to a lower explosion limit; ethane is thus included not for detection purposes but because the both ethane and methane contribute to the flammability of the mixture and hence to how close the mixture is to the lower explosion limit. Hodgkinson provides no motivation to use ethane for the purpose of detecting natural gas or to use solar radiation to detect natural gas.

c. *Determination of whether the claimed invention would have been obvious to one of ordinary skill in the art*

For at least the reasons noted above in relation to Claims 1, 2, 15, and 16, the combination of Nelson and Sachse does not render Claim 1 obvious. Hodgkinson adds nothing to Nelson and Sachse that would make Claim 1 obvious. Thus, Claim 1 patentable over the combination of Nelson, Sachse and Hodgkinson. For similar reasons, Claims 3 and 4 are patentable as well over the cited art.

Issue 3 - Whether Claims 6, 10, 18, 20, 24, 25 and 33 are unpatentable 35 U.S.C. § 103(a) over Nelson and Sachse in view of Jeon.

a. Determining the scope and content of Jeon

Jeon (U.S. Patent No. 5,742,383) teaches an apparatus for measuring the degree of inclination of a lens. The apparatus uses a beam splitter that operates by partial reflection. Jeon does not disclose or suggest detecting gases. Jeon fails to teach a bi-prism. Hence, the combination would not yield the claimed invention.

b. *Ascertaining the differences between the claimed invention and Jeon*

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Jeon contains no teachings or suggestions concerning detecting natural gas, let alone involving ethane or solar radiation.

c. Determination of whether the claimed invention would have been obvious to one of ordinary skill in the art

For at least the reasons noted above in relation to Claims 1, 2, 15, and 16, the combination of Nelson and Sachse does not render Claim 1 obvious. Applicant submits that Jeon adds nothing to Nelson and Sachse that would make Claim 1 obvious. Thus Claim 1 is unobvious in view of the combination of Nelson, Sachse and Jeon. Claims 6, 10, 18, 20, 24, 25 and 33 are thus unobvious as well, and are patentable.

Issue 4 - Whether Claim 17 is unpatentable 35 U.S.C. § 103(a) over Nelson and Sachse in view of Smith et al.

a. Determining the Scope and Content of Smith

Smith (U.S. Patent No. 6,756,592 B1) discloses using gas filter correlation radiometry in combination with an infrared camera to produce images of natural gas distribution. Smith discloses detecting "straight chain compounds such as CH_4 (methane) and C_3H_8 (propane)" (see col. 2, lines 37-38). This class of compounds would include ethane but Smith does not disclose or suggest the use of ethane to detect natural gas. Smith refers to methane as natural gas and does not disclose even that natural gas contains ethane. Smith discloses the use of thermal infrared radiation from the Earth (see col. 3, lines 62-63) and does not disclose the use of solar radiation.

b. Ascertaining the differences between the claimed invention and Smith

Smith does not contain any teaching or suggestion of the use of solar radiation in detecting natural gas. Smith implicitly teaches the detection of ethane as part of the class of

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straight-chain hydrocarbons but does not contain any teaching or suggestion towards detecting natural gas by means of detecting its ethane component.

c. Determination of whether the claimed invention would have been obvious to one of ordinary skill in the art

For at least the reasons noted above in relation to Claims 1, 2, 15, and 16, applicant submits that Claim 1 is not rendered obvious by the combination of Nelson and Sachse. Smith adds nothing to Nelson and Sachse that would make Claim 1 obvious. Claim 1 is therefore patentable over the combination of Nelson, Sachse and Smith. Claim 17 is unobvious as well, and in patentable condition.

Issue 5 - Whether Claims 21, 22 and 23 are unpatentable 35 U.S.C. § 103(a) over Nelson and Sachse in view of Jeon and Hodgkinson.

a. Ascertaining the differences between the claimed invention and Jeon and Hodgkinson

As described above in relation to Claims 3 and 4, Hodgkinson provides no motivation to use ethane for the purpose of detecting natural gas or to use solar radiation to detect natural gas, and Jeon contains no teachings or suggestions concerning detecting natural gas.

b. Determination of whether the claimed invention would have been obvious to one of ordinary skill in the art

For reasons as noted above in relation to Claims 1, 2, 15, and 16, the combination of Nelson and Sachse does not render Claim 1 obvious. The disclosures of Jeon and Hodgkinson add nothing to Nelson and Sachse that makes Claim 1 obvious. Thus, applicants submit that Claim 1 is unobvious in view of the combination of Nelson, Sachse, Jeon and Hodgkinson. Claims 21-23 are thus unobvious as well, and is patentable.

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VIII. CONCLUSION

In light of the above arguments, appellants submit that:

- Claims 1, 2, 15, and 16 are patentable over Nelson et al. (U.S. Patent No. 6,750,453 B1) in view of Sachse (U.S. Patent No. 6,611,329 B2).
- Claims 3 and 4 are patentable over Nelson and Sachse in view of Hodgkinson (WO 01/94916).
- Claims 6, 10, 18, 20, 24, 25 and 33 are patentable over Nelson and Sachse in view of Jeon (U.S. Patent No. 5,742,383).
- Claim 17 is patentable over Nelson and Sachse in view of Smith et al. (U.S. Patent No. 6,756,592 B1).
- Claims 21, 22 and 23 are patentable over Nelson and Sachse in view of Jeon and Hodgkinson.

The Board is requested to reverse the claim rejections and remand the case to the Primary Examiner for allowance.

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IX. CLAIMS APPENDIX

1. (Previously presented) A method of detecting gas leaks, the method comprising the steps of:

providing a gas filter correlation radiometer comprising a window in a housing, optics defining a first optical path and a second optical path between the window and a detector section mounted in the housing, a beam splitter mounted in the housing as part of the optics for directing radiation entering the window from the target area to divide the radiation between the first optical path and the second optical path, the first optical path having a first ethane path length and the second optical path having a second ethane path length, the first ethane path length being different from the second ethane path length, and electronics for processing signals produced by the detector section as a result of radiation being directed by the optics onto the detector section, the detection section comprising a first detector on the first optical path and a second detector on the second optical path, and corresponding pixels on the first detector and second detector having collocated fields of view corresponding to a field of view of the gas filter correlation radiometer;

traversing a target area with the gas filter correlation radiometer having the gas filter correlation radiometer field of view oriented towards the target area, the gas filter correlation radiometer being tuned to detect ethane;

sampling the corresponding pixels of the first detector and the second detector simultaneously; and

identifying a gas leak upon the gas filter correlation radiometer detecting the presence of ethane by detecting variations in solar radiation reflected from the target area and received by the respective first detector and second detector.

2. (Original) The method of claim 1 in which the gas filter correlation radiometer is tuned to detect ethane using an ethane absorption peak at 3000 cm^{-1}.

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3. (Previously presented) The method of claim 1 in which the gas filter correlation radiometer is tuned to detect ethane using an ethane absorption peak at a bandwidth of 2850 to 3075 cm^{-1}.

4. (Original) The method of claim 1 in which the gas filter correlation radiometer is tuned to detect ethane using an ethane absorption peak at a bandwidth up to 150 cm^{-1} above or below 3000 cm^{-1}.

5. (Canceled)

6. (Previously presented) The method of claim 1 in which the beam splitter comprises a bi-prism formed of a pair of wedges, each wedge having a thinner side and a thicker side, the pair of wedges being joined along the respective thinner sides and oriented so that radiation on each of the first optical path and the second optical path passes through only a respective one of the wedges.

7-9. (Cancelled)

10. (Original) The method of claim 6 in which the gas filter correlation radiometer is tuned to detect ethane using the ethane absorption peak at 3000 cm^{-1} by incorporating a filter in the optics that selects radiation in a passband that includes the ethane absorption peak at 3000 cm^{-1}.

11-14. (Canceled)

15. (Original) The method of claim 1 in which the gas filter correlation radiometer is mounted in an aircraft.

16. (Previously presented) The method of claim 1 in which the gas leak is located along a pipeline, and detection of the gas leak is carried out only using detection of ethane.

17. (Original) The method of claim 1 in which the gas leak is detected as part of a reservoir mapping process.

18. (Previously presented) A gas filter correlation radiometer, comprising:

a window in a housing;

optics defining a first optical path and a second optical path between the window and a detector section mounted in the housing;

a bi-prism beam splitter comprising a pair of side-by-side prisms mounted transversely in the housing in relation to the first optical path and the second optical path as part of the optics for directing radiation entering the window from an outside source along two divergent paths offset from each other by refraction through the bi-prism beam splitter to divide the radiation between the first optical path and the second optical path;

the first optical path having a first gas path length and the second optical path having a second gas path length, the first gas path length being different from the second gas path length; and

electronics for processing signals produced by the detector section as a result of radiation being directed by the optics onto the detector section.

19. (Canceled)

20. (Original) The gas filter correlation radiometer of claim 18 in which the gas filter correlation radiometer is tuned to detect ethane using the ethane absorption peak at 3000 cm^{-1}.

21. (Previously presented) A gas filter correlation radiometer, comprising:

a window in a housing;

optics defining a first optical path and a second optical path between the window and a detector section mounted in the housing;

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a beam splitter mounted in the housing as part of the optics for directing radiation entering the window from an outside source to divide the radiation between the first optical path and the second optical path;

the first optical path having a first gas path length and the second optical path having a second gas path length, the first gas path length being different from the second gas path length; and

electronics for processing signals produced by the detector section as a result of radiation being directed by the optics onto the detector section, the gas filter correlation radiometer being tuned to detect ethane using an ethane absorption peak at a bandwidth of at least 2850 to 3075 cm^{-1}.

22. (Previously presented) The gas filter correlation radiometer of claim 21 in which the gas filter correlation radiometer is tuned to detect ethane using an ethane absorption peak at a bandwidth up to 150 cm^{-1} above or below 3000 cm^{-1}.

23. (Previously presented) The gas filter correlation radiometer of claim 21 in which the gas filter correlation radiometer is tuned to detect ethane using the ethane absorption peak at 2850 to 3075 cm^{-1} by incorporating a filter in the optics that selects radiation in a passband that includes the ethane absorption peak at 2850 to 3075 cm^{-1}.

24. (Original) The gas filter correlation radiometer of claim 18 in which the first optical path incorporates a gas filter containing ethane.

25. (Original) The gas filter correlation radiometer of claim 24 in which the second gas path length is lower than the first gas path length.

26-31. (Canceled)

32. (Not Entered)

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33. (Previously presented) The gas filter correlation radiometer of claim 18 in which each prism of the side-by-side prisms has a thinner side and a thicker side, the pair of side-by-side prisms being joined along the respective thinner sides.

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X. EVIDENCE APPENDIX

None.

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XI. RELATED PROCEEDINGS APPENDIX

None.

Respectfully submitted,

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